BLUE ROCK ENVIRONMENTAL, INC.

FILE COPY

Mr. Bob Stone
Environmental Health Specialist
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

March 31, 2005

Re: **Groundwater Extraction Treatment System Installation Report**
Dave's 76
1666 Main Street
Fortuna, California
LOP #12708
Project No. NC-20

Dear Mr. Stone,

This report was prepared by Blue Rock Environmental Inc (Blue Rock) on behalf of Mr. Dave Ansley and presents results of the groundwater extraction and treatment system installation that was approved by the Humboldt County Division of Environmental Health (HCDEH) in a letter dated February 24, 2005.

Background

Site Description
The site is located on Main Street in the City of Fortuna, Humboldt County, California, one block northwest of the intersection of Main Street and South Fortuna Boulevard (Figure 1). The site is an active service station constructed in 1958 that sells gasoline and diesel fuel. Onsite improvements consist of a single story building, two dispenser islands and three double wall fiberglass wrapped underground storage tanks (UST). The tank complex contains one 6,000-gallon UST storing premium gasoline, one 12,000-gallon UST storing regular gasoline and one 6,000-gallon diesel UST utilizing four fuel dispensers (Figure 2). Water and sewer services at the site are provided by public utilities. The site is paved with asphalt with the exception of the northwest corner in the vicinity of the former used oil UST.

Site History
In 1995, one used oil UST was removed by the station owner. Soil and groundwater samples were not collected by the owner. In March 1999, three 6,000-gallon gasoline USTs located in a complex at the eastern end of the property, and one 2,000-gallon diesel UST located approximately 5 feet west of the south fuel dispenser island were removed by Beacom Construction of Fortuna, California. The removed USTs were replaced with the previously mentioned current UST system.

During UST excavation activities of March 1999, visibly contaminated soil was removed through overexcavation of the tank pits which formerly contained the diesel and gasoline USTs. Approximately 450 cubic yards of petroleum contaminated soil were removed from the excavations. The soil was stockpiled on site and covered with plastic sheeting. Analytical results of samples collected from the excavations confirmed the presence of gasoline and diesel range hydrocarbons in the soil and groundwater.

The excavation was deepened below first encountered groundwater. Groundwater was encountered in the excavations at a depth of approximately 5.5 feet below ground surface (bgs). Groundwater was pumped from the excavation into an onsite holding tank. In April 1999, Clearwater Group (Clearwater) installed an aeration system onsite and groundwater in the holding tank was aerated by pumping air into the standing water. This was performed to volatilize some of the existing hydrocarbons prior to offsite disposal. Aerated groundwater was subsequently disposed of offsite by a licensed contractor. As previously mentioned, the new USTs were installed in the existing excavation. The excavation associated with the diesel UST was subsequently backfilled with clean imported gravel.

Site Investigation and Corrective Action History

In September 2000, Clearwater supervised Denbeste Trucking of Windsor, California in the removal of soil generated during the overexcavation activities of March 1999. Approximately 724 tons of petroleum impacted soil was transported to Forward Inc. in Manteca, California. Soil below the former stockpile was sampled per HCDEH requirements.

On January 8, 9, and 12, 2001, Clearwater supervised Clearheart Drilling of Santa Rosa, California in the drilling of 11 soil borings. On February 14, 2001, three 2-inch monitoring wells (MW-1 to MW-3) were installed in accordance with Clearwater's *Revised Subsurface Investigation Workplan* dated November 3, 1999. Data collected during this phase of investigation confirmed the presence of gasoline, diesel and motor oil range hydrocarbons in soil and groundwater at the subject site. Results of the subsurface investigation are presented in Clearwater's *Subsurface Investigation Report* dated March 22, 2001.

On November 15, 2001, Clearwater supervised Mitchell Drilling Environmental (MDE) of Rancho Cordova, California in the installation of five 2-inch diameter monitoring wells (MW-4, through MW-8) in accordance with Clearwater's *Plume Delineation Workplan / Sensitive Receptor Survey* dated July 19, 2001. Results of the subsurface investigation are presented in Clearwater's *Additional Investigation and Fourth Quarter 2001 Quarterly Monitoring Report* dated January 10, 2002.

On June 10, 2002, Clearwater supervised MDE in the installation of four 2-inch diameter monitoring wells (MW-9, through MW-12) in accordance with Clearwater's *Workplan for Additional Investigation* dated April 8, 2002. Results of the subsurface investigation are presented in Clearwater's *Additional Investigation and Second Quarter 2002 Quarterly Monitoring Report* dated July 31, 2002.

On October 11, 2002, Clearwater supervised MDE in the installation of two 2-inch diameter monitoring wells (MW-13 and MW-14) in accordance with Clearwater's *Workplan for Additional Investigation* dated August 30, 2002. Results of the subsurface investigation are presented in Clearwater's *Additional Investigation and Fourth Quarter 2002 Quarterly Monitoring Report* dated November 25, 2002.

In accordance with Clearwater's *Workplan for Additional Investigation* dated February 20, 2003, Clearwater supervised MDE in drilling four 8-inch diameter soil borings on June 10, 2003 (MW-15 through MW-18). Results of the subsurface investigation are presented in Clearwater's *Additional Investigation and Third Quarter 2003 Groundwater Monitoring Report* dated August 5, 2003.

On February 11, 2004, Clearwater submitted a *Corrective Action Plan* (CAP) to the HCDEH. In a letter dated February 23, 2004 the HCDEH concurred with the proposed remedial action contained in the CAP. In the letter, the HCDEH recommended abandonment of MW-1, MW-2, and MW-4 prior to implementation of the proposed excavation activities. In May 2004, Blue Rock was retained by Mr. Ansley to continue site work. MW-1, MW-2, and MW-4 were destroyed per HCDEH request in June 2004.

Between the dates of October 19 and October 29, 2004, Blue Rock and Van Meter Construction completed remedial activities associated with the removal and disposal of 790 tons of contaminated soil and approximately 4,000 gallons of groundwater associated with the former UST fuel system at the subject site. Blue also installed one groundwater extraction trench for future connection to a remedial compound.

On October 22, 2004, Blue Rock proposed to relocate the position of proposed extraction trench EX-1. The proposed change was based on subsurface conditions, logistics and cost. The HCDEH concurred with this proposal in a letter dated October 26, 2004. Upon completion of the excavation activities described above Blue Rock prepared and submitted a *Remedial Report of Findings* dated November 12, 2004.

On December 20, 2004, Blue Rock performed a constant discharge test on recently installed extraction trench (EX-1). This testing was performed to determine how the trench would perform under a constant pumping rate and how the water bearing zone would respond. Results of the test and a proposed groundwater extraction and treatment system design were submitted to the HCDEH in Blue Rock's *Constant Discharge Aquifer Test and Groundwater Extraction Treatment System Design Report* dated February 3, 2005.

Purpose and Scope

The purpose of this current phase of work, and the activities associated with it, was to install a groundwater extraction and treatment system. The installation of this system was proposed in Blue Rock's *Constant Discharge Aquifer Test and Groundwater Extraction Treatment System Design Report* dated February 3, 2005, which was approved by the HCDEH in a letter dated February 24, 2005.

Field Activities

Extraction Trench and Subsurface Remedial Piping

The installation of subsurface remedial piping was completed immediately following remedial excavation activities in October 2004. Piping construction was originally presented in Blue Rock's *Remedial Report of Findings* dated November 12, 2004, but is presented again to provide a complete summary of the groundwater extraction system configuration.

In late October 2004, the extraction trench was constructed with new sch. 40 PVC 4-inch well casing materials. The trench was filled with 3/4 to 1 inch clean drain rock to 15 feet bgs and completed with river run gravel and base rock. A concrete well vault was set into the cement grout for wellhead protection and return piping was stubbed through the vault and completed to the proposed remedial compound location. The extraction trench (EX-1) was installed while backfilling the above mentioned soil excavation. Extraction trench EX-1 is essentially an extraction basin that has a 1,045 ft^2 gravel pack.

Piping runs and pull boxes were installed with new sch. 80 PVC materials. Piping trenches were installed during excavation activities and resurfaced in conjunction with other resurfacing activities. During pipe trenching activities, Blue Rock encountered the sewer lateral for the site and installed an inlet for future groundwater treatment discharge.

A piping diagram is shown on Figure 3, and a remedial system layout is shown on Figure 4.

Extraction System Installation

On March 9 and 10, 2005, Blue Rock supervised Sustainable Technologies of Alameda, California install the approved skid mounted groundwater extraction system. System installation activities included the following:

- Construction of a 12' x 12' fenced remediation compound.
- Installation of the skid mounted system which included:
  - One bag filter rated to 75 gpm and 150 psi. This filter was installed with inlet and outlet valves, pressure gauges, and a differential pressure switch.
  - The control panel was fabricated and installed to control all pumping operations. The panel is a 24"x 30" NEMA 12 enclosing the following controls: (1) emergency stop push button, (2) hand off auto switch, (2) submersible pump motor starters, (1) transfer pump motor starters, pump fuses, transfer pump level controls, an alarm light, a run light, a master relay and (2) alarm relays. A high level shutdown was installed in the storage tank.
  - One 300 gallon storage tank with a 3/4 hp transfer pump to empty the tank when full. The motor shall be TEFC continuous duty. The discharge rate will be 10 gpm at 10 psi.
- Installation of the 1 hp Grundfos submersible pump in EX-1 with a maximum pumping rate of 10 gpm. Construction of the wellhead assemblies included electrical leads, well seal, ball valves, quick connect fittings, float control switches and connections, and riser hoses.
- Electrical connections from 200 amp main panel to 40 amp sub panel located on skid assembly.

Remedial system layout is shown on Figure 4, and a process diagram is shown on Figure 5.

Treatment System Installation

In order to discharge into the City of Fortuna sewer system, Blue Rock has designed a carbon treatment system to achieve complete hydrocarbon adsorption. On March 16, 2005, two 1,000 lb. carbon vessels were delivered to the site by U.S. Filter Westates. The two vessels were placed in the remediation compound and connections equipped with sampling ports were built and installed on the inlet and outlet ports and the carbon was presoaked with clean water in preparation for treatment system operations (Figure 5).

Project Status

Currently, the groundwater extraction and treatment system is awaiting startup. Startup will commence upon issuance of the discharge permit from the City of Fortuna and permitting from the North Coast Unified Air Quality Management District. System startup and compliance reporting will be submitted with the next quarterly groundwater monitoring report.

Certification

This report was prepared under the supervision of a California Professional Geologist at Blue Rock. All statements, conclusions, and recommendations are based upon published results from past consultants, field observations by Blue Rock, and analyses performed by a state-certified laboratory as they relate to the time, location, and depth of points sampled by Blue Rock or others. Interpretation of data, including spatial distribution and temporal trends, are based on commonly used geologic and scientific principles. It is possible that interpretations, conclusions, and recommendations presented in this report may change, as additional data become available and/or regulations change.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Blue Rock has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

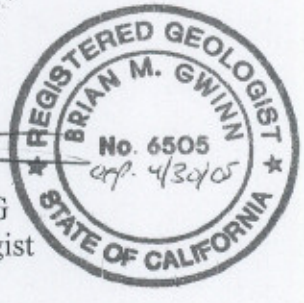
If you have any questions regarding this project, please contact us at (707) 441-1934.

Sincerely,
Blue Rock Environmental, Inc.

Prepared by:

Andrew LoCicero
Project Scientist

Reviewed by:

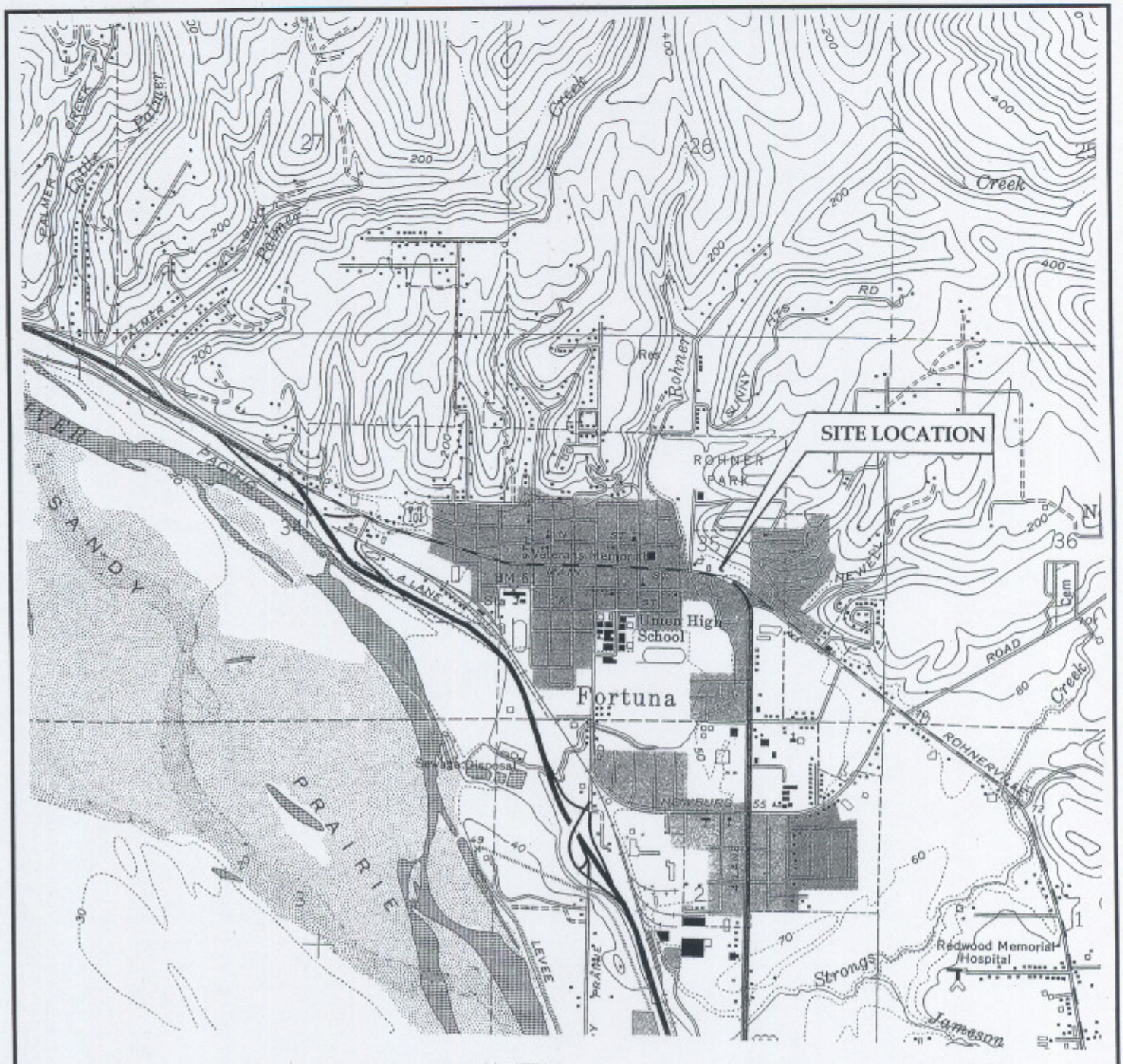


Brian Gwinn, PG
Principal Geologist

Attachments:

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Extraction Trench Diagram
Figure 4	Groundwater Extraction Basin Layout
Figure 5	Groundwater Extraction System Schematic

cc: Mr. Dave Ansley
1666 Main St
Fortuna, CA 95540



Site Location Map

Dave's 76
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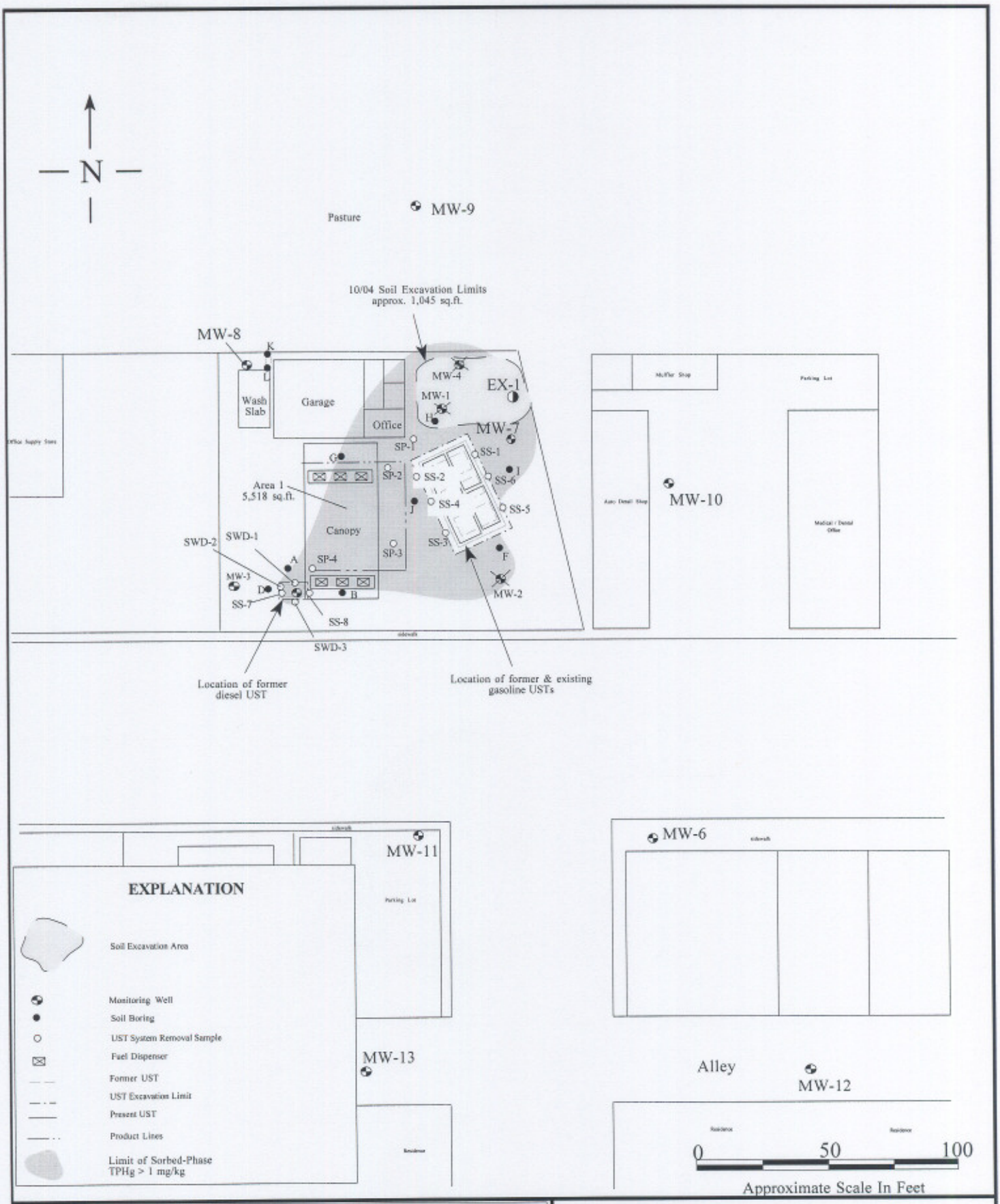
Project No.	Date	Figure
NC-20	**3/05**	**1**



Site Plan
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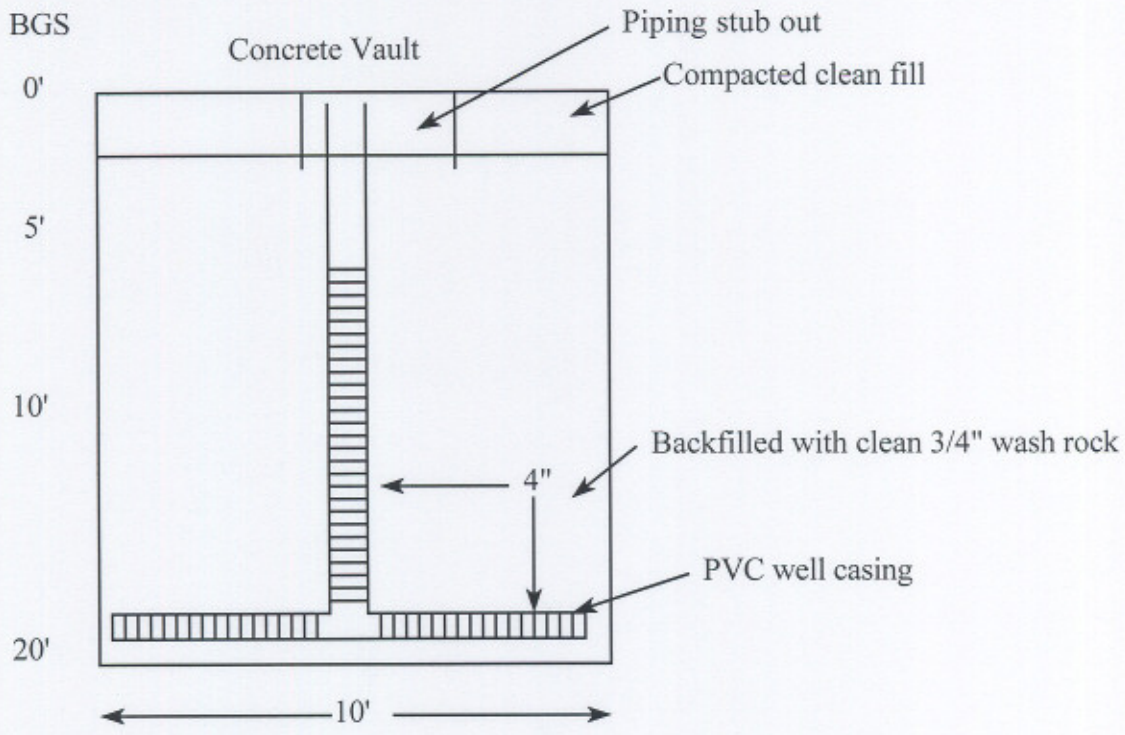
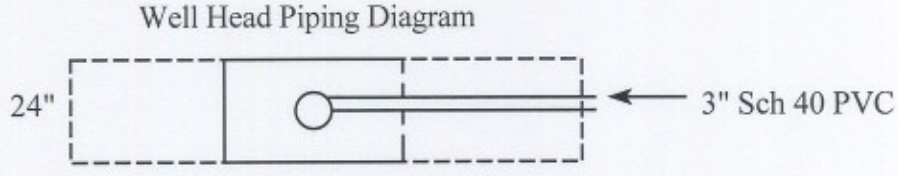
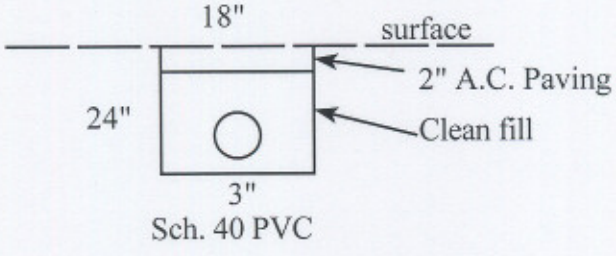
Project No.	Report Date	Figure
NC-20	**3/05**	**2**







Extraction Trench Diagram

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Project No.	Date	Figure
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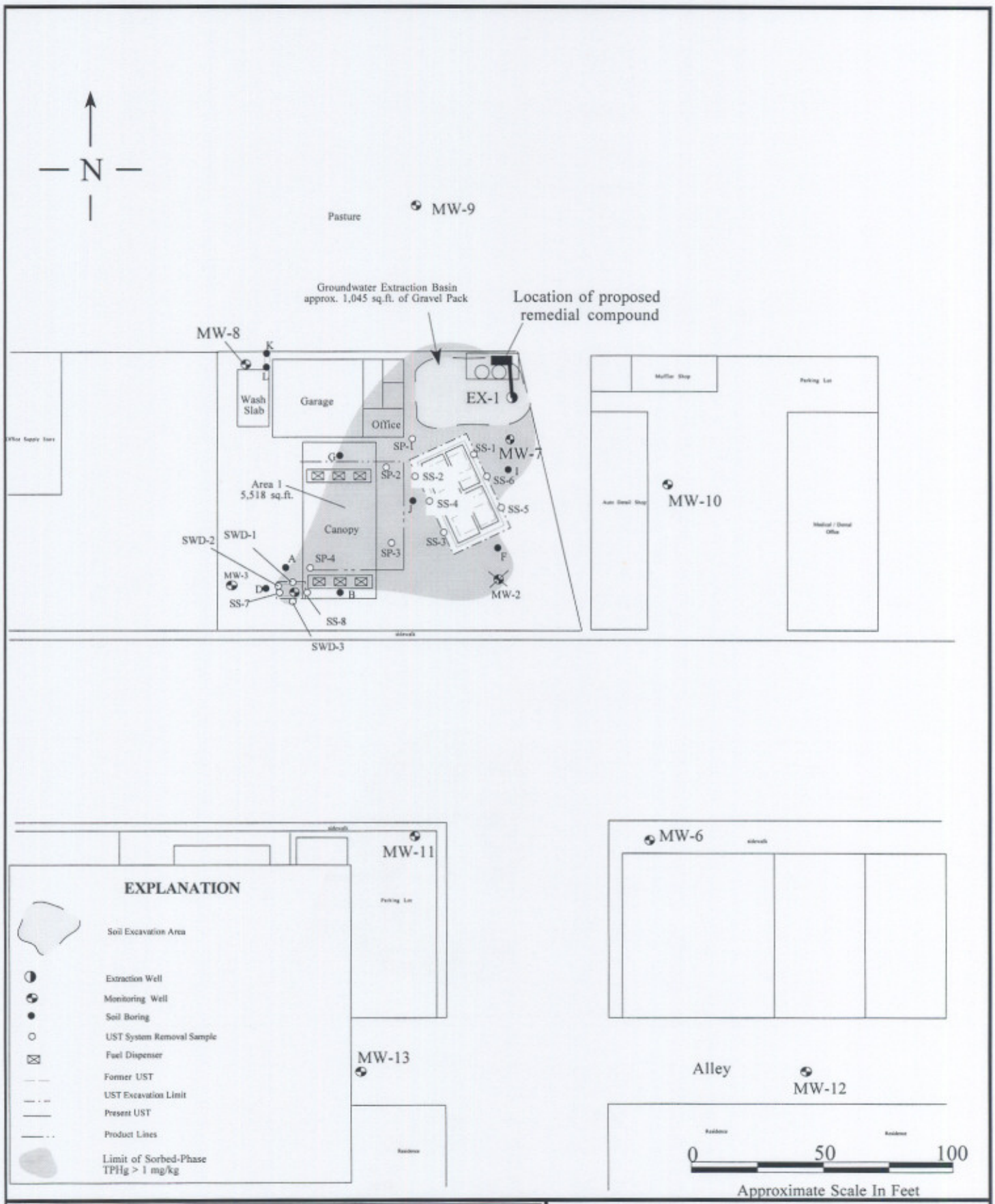

Groundwater Extraction Basin Layout

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Project No.	Date	Figure
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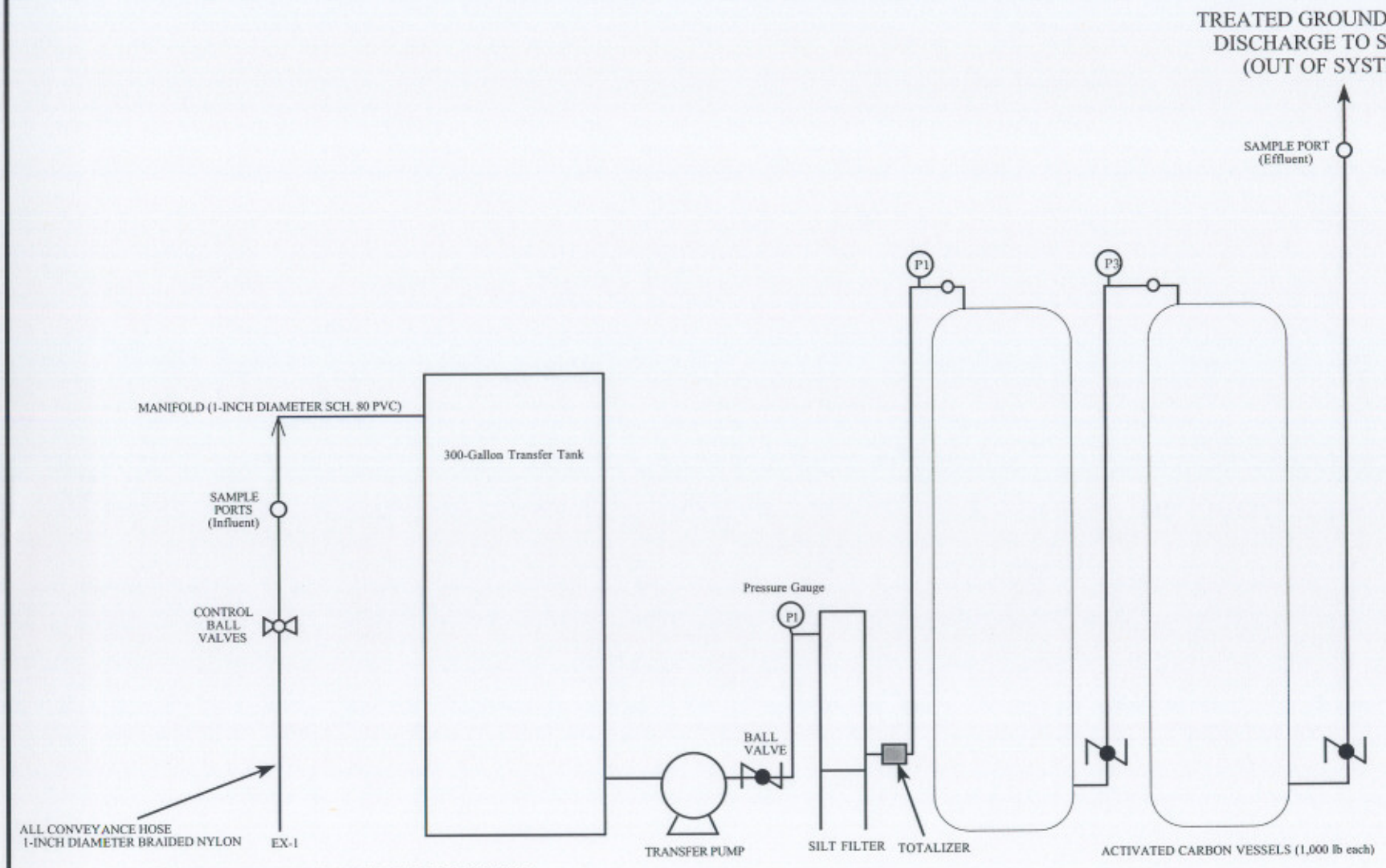

Groundwater Extraction System Schematic

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